CRITICAL ITEMS LIST (CIL)
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SYSTEM:	Thermal Protection System	FUNCTIONAL CRIT:	1
SUBSYSTEM:	LH2 Barrel	PHASE(S):	b, c
REV & DATE:	J, 12-19-97	HAZARD REF:	T.02
DCN & DATE:			
ANALYSTS:	B. Burkes/R. Lauto		

FAILURE MODE: Loss of SOFI Material

FAILURE EFFECT:
b) Loss of mission and vehicle/crew due to structural failure caused by overheating.
Loss of mission and vehicle/crew due to early engine shutdown or fire/explosion caused by loss of propellant quality.
Loss of mission and vehicle/crew due to debris impacting Orbiter in critical areas.
c) Loss of life caused by ET impacting outside the footprint due to early breakup during reentry.
Loss due to debris impacting Orbiter in critical area during TAL abort.

TIME TO EFFECT: Seconds

FAILURE CAUSE(S):
A: Material Deficiency
B: Process Deficiency

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: This foam provides insulation and thermal protection for the LH2 Barrel from prelaunch, ascent and reentry environments.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
5.2.2.1	80974018411	LH2 Tank Barrel Assy SOFI	1	LWT-54 & Up
	80971008459	TPS Closeout-Ftg LH2 Tank (Views B & C)	1	LWT-54 & Up
	80971029440	TPS Closeout Offsite (View J & AR)	1	LWT-54 thru 63
	80971029440	TPS Closeout Offsite (View BJ & BK)	1	LWT-64 & Up

REMARKS: Failure effect for P/N 80971029440 is limited to footprint violation from early breakup during reentry.

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM:	Thermal Protection System	REV & DATE:	J, 12-19-97
SUBSYSTEM:	LH2 Barrel	DCN & DATE:	
FMEA ITEM CODE(S):	5.2.2.1		

RATIONALE FOR RETENTION

STP1503 or 1513 (manufacturing option), 1512, 1518, 1532, 1535, 1536, 3004, 5009, 5013, 6005-I and 6014 are applicable to this FMEA Item Code. See Page 1 for the Retention Rationale specified by these STP's. The following additional Retention Rationale is also applicable to this FMEA Item Code:

DESIGN:

B: The TPS configuration used on the longeron/thrust strut knuckle consists of a base layer of PDL-4034/PDL-1034 foam on the knuckle skin, covered by a glass scrim cloth. The scrim cloth is saturated with adhesive (STM-M-468) and is layered over the PDL-4034/PDL-1034 foam. BX-250/BS-1171 foam is then applied over the cured scrim cloth. This concept was previously used on the Saturn S-II program, where scrim cloth was used as an adhesive carrier on movable joints. This configuration allows the knuckle to have limited mobility with minimal cracking in the external BX-250/BS-1171 foam.

B: Engineering process specification STP6001-V establishes the requirements for the glass scrim cloth installation using adhesive (STM-M-468). The process was designed to accommodate a small application and defines application parameters for the material resulting in optimum physical properties.

A, B: These materials have been approved for usage on the External Tank and are listed in the Approved Materials List (MMC-ET-SE16).

TEST:

The LH2 Barrel SOFI Application is certified. Reference MCS's MMC-ET-TM08-L-T002, T501, T503, T504 and T507. Refer to the MCS(s) for effectivity data applicable to specific part numbers and material type.

MAF:

A, B: Perform material property tests (STM-M-468) as listed in Appendix A.

B: Perform adhesive hardness and adhesive tack free tests (STP6001-V).

INSPECTION:

MAF Quality Inspection:

A, B: Verify material property tests (STM-M-468) as listed in Appendix A.

B: Verify adhesive hardness and adhesive tack free tests (STP6001-V).

FAILURE HISTORY:

Current data on test failures, unexplained anomalies and other failures experienced during ground processing activity can be found in the PRACA data base.